
ENVIRONMENTAL Fact Sheet



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West Nile Virus Environmental Issues

The recent advent of West Nile Virus into New Hampshire raises certain environmental issues. Since the virus is carried and transmitted to birds and mammals by mosquitoes, the main environmental concerns center on the use of mosquito-control pesticides. Set forth below are various considerations on pesticide usage, as well as related topics.

What environmental factors should be considered before spraying pesticides to control the West Nile Virus?

There are many environmental factors involved in deciding whether or not to use pesticides to address the threat of West Nile Virus. The State of New Hampshire has a regulatory application process, summarized below, that involves the review of these concerns. Notably, spraying near wetlands and drinking water supplies can pose special concerns, and it is paramount that the environment not be compromised when trying to combat any health threats from the West Nile Virus.

When considering spraying, some factors that must be weighed include the type of pesticide to be sprayed, the proposed method and rate of spraying, the likelihood of pesticide runoff to surface waters, and the potential for toxicity to fish and other species.

What regulatory safeguards does the State have for pesticide spraying?

Any pesticides which are proposed for use in New Hampshire must be included on a list approved by the U.S. Environmental Protection Agency (EPA). The class of pesticide typically used for mosquito control, pyrethroids, discussed below, is on EPA's approved list, and it is considered one of the more benign pesticides.

In New Hampshire, the spraying of EPA-approved pesticides is regulated through a special permit process administered by the N.H. Division of Pesticide Control, within the N.H. Department of Agriculture, Markets, and Food. The Division, with input from various state agencies, including the Department of Environmental Services (DES) and the Fish and Game Department, requires a permit application and approval to spray for mosquitoes in all of the following situations:

- Any application of pesticides to any surface water.
- Any application of pesticides made to or along any public right of way (e.g. adulticiding along public roads).
- Any aerial application of pesticides, either over water or land.
- Land applications within public water supply watersheds.

- Any application within 250 or 400 feet of public wells. (The distance is dependent on well type).
- Land applications within 25 feet of any surface water.

State approval is granted only after interagency reviews have determined that safeguards are in place. This is designed to ensure that public drinking water supplies, wildlife habitat, and wetlands ecology are not adversely affected. All applications are reviewed by key DES personnel, including public water supply experts and aquatic biologists. This scrutiny goes a long way toward ensuring that the integrity of wetlands ecology and drinking water supplies not be compromised.

Additionally, all pesticide applicators in New Hampshire must be licensed specifically to spray for mosquito control. Requirements, set forth in administrative rules, are rigorous, involving both oral and written testing.

Finally, not every situation involving the West Nile Virus will trigger a decision to spray pesticides. Public health officials in the N.H. Department of Health and Human Services, in consultation with local health officers, will first carefully evaluate the potential threat to human health, and only then make its recommendations. If the decision is made to apply pesticides, further decisions on how, where, and when will be made, and, again, state permit requirements must be met.

How potent is the type of pesticide that is generally used to control mosquitoes?

There are two broad categories of pesticides to control mosquitoes. Adulticides target adult mosquitoes, while larvicides target mosquito eggs and larvae.

The typical adulticide used in New Hampshire on mosquitoes is a pyrethroid-based product. These products are more benign than some other pesticides, notably organophosphates and carbonates. Pyrethroids are either biological derivatives of flowers of the pyrethrum plants (e.g., chrysanthemums) or they are synthetic equivalents. Pyrethroids have been registered with EPA since the 1970s and are commonly sold as household sprays, flea dips and sprays for cats and dogs, and livestock and garden products.

The potency of pyrethroids is relatively short-lived, especially in high temperatures and sunlight. Therefore, they are used to control adult mosquitoes in urban residential environments. Most people would not be expected to experience any symptoms from spraying operations. Also, humans and other mammals have the ability to rapidly break down (detoxify) pyrethroids and remove them from their bodies. Threats to drinking water from pyrethroids are minimal.

However, upon direct contact with pyrethroid containing products, some people may develop temporary skin irritations, stuffy or runny noses, or mild respiratory, throat or eye irritations. Therefore, people near spraying operations are asked to take standard precautions during spraying, like keeping windows and doors closed during the actual spraying.

It should be noted that the licensed pesticide applicators do not spray during windy conditions, further reducing the possibility of adverse health and environmental impacts.

What impacts can pyrethroids have on the environment?

Pyrethroids have a relatively low persistence in the environment and break down very quickly in sunlight. They also readily bind to soils and thus are not expected to contaminate groundwater.

However, pyrethroids are toxic to bees, fish and other aquatic life forms, including beneficial fish and insects that serve as mosquito predators. For this reason, the U.S. Environmental Protection Agency has established specific precautions on the label to reduce such risks, including restrictions that prohibit the direct application of products to open water or within 100 feet of lakes, streams, rivers, or bays. (EPA fact sheet #735-F-00-004, May 2000).

How are adulticides applied?

Most pyrethroid mosquito control products can be applied only by trained personnel. Mosquito control professionals apply pyrethroids as an ultra low volume (ULV) spray, either from special trucks or by individuals on foot carrying backpacks and spray applicators. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

Do larvicides pose less of a threat to wetlands ecology, wildlife, and public drinking water supplies than adulticides?

There are several types of larvicides, some of which are more environmentally benign than adulticides. Notably, bacterial organisms (Bti products) and monomolecular larvicides that create a very thin surface film on water are best for applying to wetlands, catch basins, storm drains, roadside ditches, and reservoirs.

Unlike adulticides, larvicides can be more selectively applied in specific, controlled locations. Again, they can be applied in storm drains, catch basins and other areas to which the general public has no access. However, they should not be applied to areas that drain into waters consumed by humans. Note also that some larvicides can cause eye or skin irritation to people who use them without following precautions.

What mosquito control approach involving pesticide applications is the most effective?

When possible, long-range programs, often involving the use of larvicides, are the most effective means of applying pesticides for reducing mosquito populations. Currently, a number of Seacoast municipalities have long-term mosquito control programs administered with care under licensed applicators under State approved permits. Those programs rely primarily on the use of the more benign larvicides rather than random spraying for adults, which can be less effective.

Now that the West Nile Virus has reached New Hampshire, must people still obtain a State wetlands permit if they wish to fill or drain wetlands on their property?

Yes. The Department of Environmental Services continues to ensure the protection of New Hampshire's valuable wetlands resources through a permitting process required for work conducted in a wetlands. This includes all proposals for draining and filling wetlands of any size.

It should be noted that the type of mosquito that is the prevalent carrier of the West Nile Virus, *Culex pipiens*, is typically found in urban settings, not in ecologically diverse rural wetlands which support a healthy ecosystem of mosquito predators such as fish and dragonflies.

What can individuals do to reduce mosquitoes around their homes?

People should eliminate shallow standing water around the home from catch basins, bird baths, yard pools, old tires, clogged rain gutters, etc. since standing shallow water can be a mosquito breeding area, especially for the more urban *Culex pipiens* species. Specifically, here are some steps that you can take:

- Make sure that doors and windows have tight-fitting screens. Repair or replace all screens in your home that have tears or holes.
- Remove all discarded tires from your property. The used tire has become a significant mosquito breeding habitat in this country.
- Dispose of tin cans, plastic containers, ceramic pots, or similar water-holding containers. Do not overlook containers that have become overgrown by aquatic vegetation.
- Drill holes in the bottom of recycling containers that are left out of doors. Drainage holes that are located on the sides collect enough water for mosquitoes to breed in.
- Make sure roof gutters drain properly. Clean clogged gutters in the spring and fall.
- Clean and chlorinate swimming pools, outdoor saunas and hot tubs. If not in use, keep them empty and covered.
- Drain water from pool covers.
- Aerate ornamental pools or stock them with fish. Don't allow them to stagnate.
- Turn over wheelbarrows and change water in bird baths at least twice weekly. Both provide breeding habitat for domestic mosquitoes.
- Turn over plastic wading pools when not in use.
- Eliminate standing water that collects on your property. Use landscaping as needed. Mosquitoes will develop in any puddle that last more than four days.
- Remind or help neighbors to eliminate breeding sites on their properties.

Where can people learn more about the West Nile Virus and related topics?

To learn more about the West Nile Virus in New Hampshire, contact the N.H. Department of Health and Human Services at 1-866-273-6453 (a toll-free telephone number), or visit their web page at www.dhhs.state.nh.us. People may also contact the N.H. Department of Environmental Services at 603-271-2975 or the N.H. Division of Pesticide Control at 603-271-3550.